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CURRENT ACTIVITIES

ATLANTIC PROVINCES

Larch Sawfly in the Maritime Provinces.—A review of the larch sawfly and its important parasites in the Maritime Provinces up to 1953 has been published by W. A. Reeks (Canad. Ent. 86(10): 471-480, 1954). Since that time sawfly numbers have been very low in New Brunswick and the insect has not been collected in Prince Edward Island. Annual collections taken in Nova Scotia from 1954 to 1958 totalled 1, 4, 46, 232, and 99, respectively. These totals indicated an increase in numbers and distribution of the sawfly, particularly in parts of the southern and western counties along the coast.

In 1955 the first defoliation of tamarack trees by the sawfly in Nova Scotia since 1942 was observed at Black Point, Halifax County, where up to 10 per cent defoliation occurred in a stand of about two acres. In 1956, light defoliation was observed in three areas of Halifax County: at Black Point, on the old Guysborough Road, and near Musquodoboit Harbour. These light infestations coalesced in 1957 and many tamarack stands throughout southern Halifax County, west along the coast to Chester, Lunenburg County, and northeast to Gegogan Brook, Guysborough County, showed traces of defoliation. Some trees at Goff's Corner, Oyster Pond, Little Salmon River, and Spry Bay lost about 25 per cent of their foliage. In 1958 the insect was found over a wider area than in previous years and was collected in Hants, Digby, Yarmouth, Shelburne, Lunenburg, Colchester, Halifax, and Guysborough counties. Numbers were generally small and defoliation was negligible in most localities. Defoliation was as high as 40 per cent, however, on trees near Hassett, Digby County, and about 60 per cent of the foliage on some reproduction was destroyed at Pope's Harbour, Halifax County.

In Manitoba and Saskatchewan, the sawfly has developed resistance to the introduced parasite *Mesoleius tenthredinis* Morley by the capacity to encapsulate the parasite egg (J. A. Muldrew, Can. J. Zool. 31: 313-332, 1953). Each year since 1956, several hundred cocoons from Nova Scotia were reared and progeny from adults were tested for reactions to attack by *M. tenthredinis*. Emergence from 1956 rearings totalled 125 sawfly adults and 20 *M. tenthredinis* adults; corresponding rearings of 1957 material resulted in 526 sawfly adults and 45 *M. tenthredinis* adults. Successful parasitism is thus 14 and 8 per cent, respectively, based on total adult emergence, but these figures give no indication of the degree of resistance to *M. tenthredinis*. Examination of sawfly larvae exposed to parasite attack showed varying degrees of encapsulation of eggs; the percentages of successful hatch of *M. tenthredinis* eggs in six families of larvæ were 15 and 17 in 1956, and 82, 25, 100, and 100 in 1957. Although this indicates that a proportion of the population may still be highly susceptible to the parasite, the number of families tested is too small to permit any conclusions on the average susceptibility of the population.

Apart from occasional specimens affected by a fungus, *Isaria farinosa* (Dicks.) Fr., (A. B. Baird, Proc. Acadian Ent. Soc. 8: 158-171, 1923) no disease has been found in the larch sawfly in the Maritime Provinces.—F. G. Cuming, J. A. Muldrew, and R. S. Forbes.

ONTARIO

White Pine Weevil.—Investigations of the physical and biological requirements of *P. strobi* adults and larvæ in 1958 placed emphasis on the determination of factors limiting successful weevil attack and development in white pine growing in mixture with over-topping hardwoods. Although climate is one of the major limiting factors, it is of interest to note that the physical attributes of white pine, through their effect on weevil behaviour, are factors that contribute to the high mortality of the insect in stands where climatic conditions permit only a low level of feeding and oviposition.

Normally, in open growing stands weevil adults show a definite preference for vigorous leaders; in terms of leader diameter, measurements taken near Chalk River, Ontario, have shown that the incidence of weevil attack increased from zero among leaders of 4 mm. upper diameter to 80 per cent among leaders of 9 mm. upper diameter. In addition, the insects confine this feeding and oviposition to the leading shoot of the trees, distributing their eggs from the upper to the lower levels of the leader in accordance with the presence of suitable oviposition sites. This pattern of attack adds materially to the chances of survival of the developing larvæ because, within a few days after eclosion, they are able to aggregate at a common feeding site, a characteristic essential to their successful development. When the larvæ are present in small numbers, or when individuals fail to contact the main feeding aggregate, they are pitch-drowned. Although some larvæ in over-populated leaders die of starvation, the success of the remainder is dependent upon female weevils depositing their eggs in such a pattern that will lead to aggregations of the larvæ.

In shaded stands weevil habitats differ climatically and physically from those in exposed stands. Associated with these differences are definite changes in the oviposition behaviour of the weevil that are followed often by complete mortality of the larval populations in individual leaders. Weevil females fail to deposit a sufficient number of eggs in a localized area of the main stems of shaded trees to produce an aggregate of larvæ with some chance of survival. It appears that at least a part of their selection of oviposition sites is based on a preference for areas on the main stem that are of particular diameter, but this behaviour pattern is disrupted by the inherent characteristic of the insect to move to the upper portion of the terminal shoot. Consequently, not only are few eggs deposited, but they are distributed over some four or five years growth of the main stem, a condition that is not conducive to the formation of aggregations of larvæ at a common feeding site.

On exposed trees, the tendency of the adults to move to the upper portion of the main stem and confine their feeding and oviposition activity to a localized area occurs in accordance with their reactions to light and temperature and their negative geotactic reactions. On shaded trees, however, movement down the stem and subsequent feeding and oviposition activity on the older growth does not appear to be influenced in any way by climatic factors. Bark temperatures along the portion of the main stem containing eggs are practically identical, with differences from the upper to the lower levels normally of the order of 0.5, and rarely as high as 1.5°C. Habitat climate is, however, responsible for the general reduction in the absolute number of eggs deposited in shaded habitats. In addition, by slowing down the general feeding rate of any larvæ that do occur in their widely scattered positions on the main stem, habitat climate, and in particular, temperature, serves to increase the chances of their being pitch-drowned before they are able to aggregate at a common feeding site.—C. R. Sullivan.

Insects on Trembling Aspen.—A study of insect species occurring on trembling aspen has been initiated in northwestern Ontario. The Forest Insect Survey from 1950 to 1957 inclusive recorded 56 species collected from aspen in the Kenora and Sioux Lookout Districts: the present study, confined to the same districts, records 78 additional species. Thus there are at least 134 species that spend part or all of their life cycle on aspen in these districts. During 1956, 1957, and 1958, immature forms of 94 species were collected from and reared on either aspen foliage or aspen catkins to the adult stage. The orders, families, and the number of species in each family are listed in Table I.

Most of the species are not common and have only been reared in small numbers. Life history and larval identification studies are now being carried out on the more abundant species, which include; *Gonioctena americana* Schæff., *Rhabdophaga* sp., *Enargia decolor* Wlk., *Xylomyges dolosa* Grt., *Epinotia nisella* Clerck. and *Sciaphila duplex* Wlshm.—A. H. Rose and E. P. Smereka.

TABLE I

Order	Family	No. of Species
Coleoptera	Chrysomelidae	3
	Curculionidae	1
Diptera	Itonididae	1
Homoptera	Cicadellidae	2
Hymenoptera	Cimbicidae	1
	Tenthredinidae	10
Lepidoptera	Coleophoridae	1
	Gelechiidae	6
	Geometridae	11
	Gracillariidae	3
	Lasiocampidae	3
	Noctuidae	17
	Notodontidae	9
	Nycteolidae	1
	Oecophoridae	3
	Olethreutidae	9
	Papilionidae	1
	Pyralididae	2
	Saturniidae	1
	Sphingidae	1
	Tortricidae	8

PRAIRIE PROVINCES

A Screening Test for Fungicides not Toxic to Pine.—Repeated applications of soil fungicides are needed to control the damping-off of conifers. Because of the prolonged sensitivity of the seedlings it is necessary to use fungicides with low toxicity. Earlier screening tests suggested that few fungicides have a wide difference between *dosis tolerata* and *dosis curativa*. These included thiram, captan, and the antibiotic Rimocidin. *Pythium* was controlled by several dithiocarbamates at a lower concentration than was *Rhizoctonia*.

Further tests have revealed a few new fungicides of promising quality. The screening tests were made in agar medium in petri dishes, applying the same technique as described earlier (Vaartaja, O. 1956. Screening fungicides for controlling damping-off of tree seedlings. Phytopathology 46: 387-390) except that only one host species was used. This was jack pine (*Pinus banksiana* Lamb.) The test fungi were *Rhizoctonia solani* Kühn (*Pellicularia praticola* (Kotila) Flentje) and *Pythium debaryanum* Hesse.

Of 88 fungicides tested, some of the most promising (see Table 1) were: Bayer 15080 (benzoyl-2-p-nitrosophenylhydrazine) supplied by Chemagro Corp., Bayer 22555 (p-dimethylaminobenzenediazo sodium sulfonate) supplied by Chemagro Corp., B1843 (trans 1, 2 bis propyl sulfonylethylene) supplied by Chemagro Corp., C-272 (trans 1, 2, bis ethyl sulfonylethylene) supplied by Chemagro Corp., Candidin (a polyene antibiotic) supplied by W. A. Taber (National Research Council, Prairie Regional Laboratory, Saskatoon, Sask.), Citroxin (8-quinolinol citrate) supplied by Midvale Chemical Co., Cunilate (copper 8-quinolinol), Cyprex (n-dodecyl quanidine acetate) supplied by North American Cyanamid Ltd., Dyrene (2, 4-dichloro-6-(chloroanilino)-2-triazine) supplied by Green Cross Insecticides, manganese omadine (Mn salt of pyridine ethione 1-oxide) supplied by Olin Mathieson Chemical Corp., Opalate (ziram, zinc dimethyldithio-carbamate) supplied by California Spray Chemical Corp., Phytoactin (a polypeptide antibiotic) supplied by Pabst Laboratories, and 8599 (s-trichloromethyl p-toluenethio sulfonate) supplied by North American Cyanamid Ltd. Tersan (thiram, bis (dimethylthio-carbamoyl) disulfide) was used as a standard representing the materials tested earlier. (Opalate (ziram) is a well established fungicide but it is included in the table because it was not tested in the earlier screening.)

TABLE 1.

MOST PROMISING RESULTS OF SCREENING TESTS OF 88 EXPERIMENTAL FUNGICIDES IN THE CONTROL OF *Pythium* (P) AND *Rhizoctonia* (R) DAMPING-OFF

Fungicide	% of active ingredients	Concentration in top layer of agar, ppm.											
		10		20		100		200		500		1000	
		P	R	P	R	P	R	P	R	P	R	P	R
Bayer 15080	50	.	—	+	—	+	.	+	.	t			
Bayer 22555	50	.	—	.	—	.	—	.	.	.	+	t	
B-1843	20	—	—	.	+	+	+	t					
C-272	20	—	—	+	—	+	—	+	—	+	.	t	
Candidin	100	—	—	—	—	—	—	.	+	+	+	t	
Citroxin	100	—	.	+	.	t							
Cunilate	10	.	+	.	+	+	+	t					
Cyprex	70	+	.	+	.	+	.	t					
Dyrene	50	—	+	.	+	.	+	.	+	.	+	.	+
Mn-omadine	50	—	—	+	—	+	.	+	+	+	+	+	+
Opalate	76	—	—	—	.	+	+	+	+	+	+	t	
Phytoactin	2	—	—	.	—	.	—	.	+	.	+	t	
Tersan	75	—	—	.	—	+	.	+	+	+	+	+	+
8599	50	—	—	—	—	+	—	+	.	+	.	+	.

\+ Survival of seedlings 80—100% after 2 weeks.

. Survival 30 to 75% (partial control) after 2 weeks or 80—100% after 1 week but less after 2 weeks (good but temporary control).

t Slightly toxic to the plants; chemicals with + at 1000 ppm. were slightly toxic at 2000 ppm.

In addition to Tersan, Omadine and Dyrene showed a very wide range of useful activity. The latter was remarkable as being especially effective against *R. solani*. The range of Bayer 22555 was very wide on *Pythium* but the control did not last for 2 weeks. Dyrene, Cyprex, and Cunilate gave good control at very low concentrations.

The fact that a fungicide proved to be effective on agar medium does not necessarily indicate that it will perform well in soil. Chemicals are known to be inactivated in soils in various ways. On the other hand, a chemical which does not pass the above rigorous test could occasionally give good control in soil if it exerts a favourable selectivity on soil microflora under certain conditions.—O. Vaartaja.

ROCKY MOUNTAIN REGION

Hylobius warreni* Wood *in Alberta.—Studies of *Hylobius warreni* Wood were initiated in Alberta in 1957. Sampling by the author and forest biology rangers indicates that this weevil is distributed widely throughout the Province. The distribution corresponds roughly with that of the Boreal Forest Region in Alberta. In the foothills the most southerly location was at the Elbow Ranger Station, southwest of Bragg Creek. The westerly extension appeared to follow a line from Kananaskis through Nordegg to the Coal Branch. The northern distribution is not well known but scattered collections indicate the weevils' presence throughout the whole northern part of the Province, where suitable hosts are found. It is apparently present in the forested area east to the Saskatchewan border and in the Cypress Hills to the southeast.

The primary host in Alberta is lodgepole pine but the weevil has been collected from white spruce, alpine fir, and larch. No tree mortality attributable to *Hylobius* attack was observed although as many as 24 larvae were found on a single tree.

Intensive investigations in a forest management experiment block, where several cutting systems were used, indicated that the effect of a cutting method which reduced the number of stems per acre was to concentrate the surviving population in the residual stand. This was most pronounced in the seed tree block where only 10 trees per acre were left. However, the total population of *Hylobius* was reduced in proportion to the degree of thinning.

The populations now present in Alberta are not high enough to cause tree mortality even when concentrated as above but such a condition could occur, particularly in regeneration areas.

Empirical calculations indicate that during its development a *Hylobius* larva could girdle trees up to 7 inches in diameter, although this was never observed. Larval feeding is generally confined to roots or root crotches and the injury caused does not materially affect feeding roots or the trunk cambium.

On the basis of head capsule measurements it was determined that *H. warreni* in Alberta passes through six larval instars and a short prepupal stage. Head capsule growth follows a geometrical increase, and increase in body length is uniform with instar. During the prepupal stage the larva contracts in length, with a corresponding increase in girth.

All stages are found in the field at any time of the year. The bulk of the population in the Strachan area of Alberta appear to have the following life cycle; eggs are laid from late June to late August, most hatching by September; the first- and second-instar larvae overwinter and feed as larvae all the next summer; they overwinter again as fifth- and sixth-instar larvae, pupate in June after a short prepupal stage, and emerge in late June and July. Adults may live for several years (at least two) and continue to lay eggs, causing overlap of generations.

Natural control factors appear to be negligible in the later stages of the populations present. Parasitism was very low and disease, if present at all, was also low. As no successive measurements of a single population were made, the losses due to control factors may be far in excess of those observed.

The incidence of *Armillaria mellea,* the shoestring fungus, was very low, less than 10 per cent. Again this figure may be misleading, as examination was made only in the root and root collar regions where *Hylobius* injury occurred. The fungus may attack any portion of the root system of a weakened tree.—R. W. Stark.

The Distribution of Red Stain in Lodgepole Pine of Peeler Quality.—Red stain of lodgepole pine, *Pinus contorta* Dougl. var. *latifolia* Engelm., heartwood, now known to result from infection by one or more of several wood-inhabiting fungi, including *Stereum pini* (Schleich. ex Fr.) Fr., *Stereum sanguinolentum* Alb. and Schw. ex Fr., *Fomes pini* (Thore ex Fr.) Karst., and *Polyporus anceps* Peck, is believed to affect adversely the strength and gluebond prop-

erties of lodgepole pine veneer. Since an appreciation of the incidence and amount of red stain could prove useful to companies utilizing lodgepole pine for plywood manufacture, a survey was made for this purpose in March, 1958 in the Grande Prairie district, Alberta. The survey was conducted by the Calgary Forest Biology Laboratory in cooperation with the Alberta Department of Lands and Forests and Northern Plywoods Limited.

One hundred and forty trees on seven randomly-distributed plots were felled and sectioned at standard intervals (8 ft. 7 ins.), to permit the detection of red stain and advanced decay. The trees thus examined had an average age of 140 years (70-179 years), an average height of 87 ft. (63-110 ft.), and an average diameter at breast height of 12.9 in.

The volume of wood affected by red stain and decay amounted to 8.3 per cent and 8.0 per cent on the basis of the sample trees being utilized for plywood (minimum top diameter 10 ins.) and pulpwood (minimum top diameter 4 ins.) respectively. The amount of red stain that may be expected to occur in the recoverable veneer volume of trees of different sizes is presented in the following table.

RELATION OF TREE DIAMETER TO DEGREE OF RED STAINING IN THE VENEER VOLUME OF LODGEPOLE PINE

D.b.h. in	No. trees	Volume (cu. ft.)*			Percentage of veneer volume with red stain
		Gross	Cull	Veneer	
13	8	26.4	9.7	16.7	14.4
14	14	32.4	14.4	18.0	7.8
15	17	41.2	16.4	24.8	2.8
16	15	48.4	17.3	31.1	2.9
17	4	57.8	20.8	37.0	6.7
18	3	67.2	24.5	42.7	—
19	2	80.5	22.5	58.0	—
20	—	—	—	—	—
21	2	101.8	24.0	77.8	10.8
Total Average**	65	44.4	16.4	28.0	7.6

* Gross—Volume between S.H. (1.0 ft.) and 10-in. top.
Cull—Volume of 8-in. peeler core, advanced decay outside peeler cores, and volume of logs not suitable for peeling because of extensive rot at the centre.
** Average—Values are weighted by number of trees per diameter class.

The percentage of infected trees decreases in the larger diameter classes, but increases in the small, scattered group of large-diameter (17 ins.+), open-grown trees which make up approximately 7 per cent of the total number of trees in the stand. This condition is reflected in the table, which suggests that in terms of the percentage of veneer volume that is affected, red stain is generally more common in the small diameter trees of peeler quality.—A. A. Loman.

BRITISH COLUMBIA

Some Physiological and Anatomical Characteristics of Populus spp. as Related to Infection by Cytospora chrysosperma Fr.—Differential resistance to canker caused by *Cystospora chrysosperma* Fr. was observed in three species of poplar growing at a nursery on Lulu Island, B.C. The species concerned were *Populus trichocarpa* T. & G., a native; and two hybrids, *P. regenerata* and *P. robusta* var. *bachelieri*. The resistance to *Cystospora* increased in the order named.

Laboratory experiments with cuttings of the above species demonstrated a negative correlation of the bark moisture content and canker growth. Experiments using three fixed levels of moisture content of cuttings and three temperature levels showed significant differences in canker growth between levels of both factors and for all species. These differences confirmed the correlation.

Experiments with fixed levels of both atmospheric moisture and moisture content of cuttings showed significant differences of canker growth rate between levels for both factors and for all species. The differences were correlated with bark and wood moisture changes during the experiment.

Greenhouse experiments with 4-month-old plants of *Populus regenerata and P. robusta* showed infection could be obtained only when the plants were subjected to a drought regime and were exposed to low atmospheric humidity.

Anatomical differences observed in the wood and bark tissues of the three species suggest a basis for differences in water economy, and, hence, differences in physiological resistance to infection by *Cytospora*.

Differences occurred between species in pith size; vessel number and lumen diameter; sieve tube number and diameter; periderm thickness; number and arrangement of phloem sclerenchyma; compactness of cortex and other factors determining the efficiency of the stem in water storage, translocation, and retention. These differences coincided with the observed differences in resistance of the poplar species.—W. J. Bloomberg.

High Temperature Damage to Douglas Fir Seedlings.—Losses of Douglas fir seedlings due to heat injury were heavier than usual at the British Columbia Forest Service Nursery at Duncan in 1958 because of an unusually warm dry summer. On 2-0 stock, direct heat damage was slight but growth was retarded, presumably by drought. Most seedlings that had overwintered without frost damage reached plantable size. Seedlings that had been injured by frost, however, failed to reach plantable size, although they usually do so when a good growing season follows moderate frost injury.

Losses of 1-0 seedlings from heat injury were intensified by the fact that shade and water were reduced to control damping-off. The typical symptom of heat injury, a constriction or canker at the base of a seedling, was common. Incidence of the damage varied in different beds according to differences in cultural practices. One part of the nursery had been sowed about May 7 and another about May 14. Alternate beds throughout both parts were given the usual soil cover, or soil cover plus a mulch of dark sawdust. Heat damage was greater in the younger seedlings than in those a week older, and greater in beds mulched with dark sawdust than in those with only cover soil. Thus, the greatest losses, up to 50 per cent of some beds, resulted where the younger seedlings and the sawdust mulch occurred together.

By Munsell's colour charts, the dry sawdust cover was reddish brown (2.5Y, $\frac{4}{4}$) and the dry cover soil was pale olive (5Y, 5/3). In two selenium-cell light-meter readings, relative reflection from dry sawdust and dry cover soil was approximately 125:200 and 85:150. The following soil surface temperatures were indicated by dial thermometers with stainless steel shafts approximately 5mm. in diameter, which were laid on the cover surfaces after heat injury had been noticed; the air temperatures are as read from a maximum-minimum thermometer under approximately standard conditions at breast height about 100 yards from the seed beds.

June 17, 3:30 p.m.

Air temperature in shade	91°F.
Temperature at surface of cover soil in full sunlight	128°F.
Temperature at surface of sawdust cover in full sunlight	148°F.

June 18, 11:15 a.m.

Air temperature in shade	90°F.
Temperature at surface of cover soil in full sunlight	133°F.
Temperature at surface of sawdust cover in full sunlight	148°F.

These temperature records are in general agreement with a number of reported tests in which more precise instruments and methods have indicated surface temperatures of 140 to 150°F., or even higher, where heavy mortality to seedlings, especially very young seedlings, was taking place.—P. J. Salisbury and J. R. Long.

The Effect of Moisture and Temperature on the Emergence of the Larva of the Douglas-fir Cone Midge, Contarinia oregonensis Foote from Cone Scales.—Larvæ of the Douglas-fir cone midge, *Contarinia oregonensis* Foote, emerge from galls in the cone scales in the fall of the year when rains have commenced and temperatures dropped. The cones are still on the tree at this time and the larvæ vacate them to enter the duff where they spin puparia and overwinter.

An experiment was conducted to determine the effect of moisture and temperature on larval emergence from the cones.

Three hundred and twenty galled cone scales were divided into four equal groups and treated as follows: 1, air dry; 2, soaked in water for 5 minutes; 3, soaked in water for 1½ hours; 4, soaked in water for 6 hours. These treatments are referred to as: 1, dry; 2, moist; 3, wet; 4, saturated. Each treatment was divided equally between five plastic bags. One bag from each group was exposed to the following temperatures (Centigrade): 0°, 5°, 10°, 15°, and 20°.

Tables I and II show that moisture is necessary before larvæ will emerge. In the presence of moisture insects emerged at all five temperatures, and Table II shows that the highest percentage emergence (76.5) occurred under maximum moisture conditions, regardless of temperature.

Table III shows that higher temperatures are not conducive to emergence; only 21.0 per cent of the larvæ emerged at 20°, but 51.0 per cent emerged at 10°.

These data show that: 1. larvæ of the Douglas-fir cone midge will not emerge from galls under air-dry conditions; 2. moisture is required before emergence will take place and a saturated condition is preferred; 3. althought larvæ emerged throughout the temperature range they showed preference for the lower temperatures.—A. F. Hedlin.

TABLE I

Emergence of *Contarinia Oregonensis* Larvae from Douglas-fir Cone Scales under different Temperature and Moisture Conditions

Temperature (°C.)	Moisture*	No. of larvae		
		Total	Emerged	
			No.	%
0	1	49	0	0
	2	46	2	4.3
	3	89	74	64.2
	4	61	51	82.0
5	1	45	0	0
	2	24	5	20.8
	3	67	60	89.5
	4	73	65	88.0
10	1	61	0	0
	2	43	10	23.2
	3	54	46	85.2
	4	45	43	95.5
15	1	24	0	0
	2	39	16	41.0
	3	39	22	56.4
	4	43	30	69.8
20	1	42	0	0
	2	29	1	3.4
	3	33	11	33.3
	4	57	27	47.4

* 1. Dry; 2. Moist; 3. Wet; 4. Saturated.

TABLE II

Comparison of Emergence at Four Moisture Levels

Moisture level	1	2	3	4
Per cent emerged	0	18.5	65.7	76.5

TABLE III

Comparison of Emergence at Five Temperatures

Temperature (0°C.)	0	5	10	15	20
Per cent emerged	37.6	49.6	51.0	41.8	21.0

Nematode Assays of some Forest and Nursery Soils in British Columbia.—In a project conducted by the Plant Pathology Laboratory at Saanichton and the Forest Pathology Unit in Victoria, soil samples from forest nurseries at Campbell River, Duncan, New Westminster, and Cranbrook, and from the West Kootenay forest region were examined in 1958 for the presence of plant-parasitic nematodes.

Twenty-one sites in the West Kootenay region were sampled five times at monthly intervals. Small populations of ring nematodes, *Criconemoides* spp. (pathogenic), were found in 65 of 104 samples, representing 20 sites. Saprogenous nematodes included species of the following genera: *Alaimus, Aphelenchoides, Cephalobus, Cervidellus, Chiloplacus, Diplogaster, Dorylaimus, Mononchus, Pungentus, Rhabditis, Tylenchus,* and *Wilsonema.*

Duncan, Campbell River, New Westminster, and Cranbrook nurseries were sampled only once during the summer. Trace populations of *Xiphinema* sp. (pathogenic), were found in one sample from Duncan and in one sample from Campbell River. No plant-parasitic nematodes were found in samples from New Westminster or Cranbrook. Saprogenous nematodes from forest nurseries included the following genera: *Aphelenchus, Aphelenchoides, Cervidellus, Chiloplacus, Diplogaster, Dorylaimus, Mononchus, Rhabditis,* and *Tylenchus.*

In all the samples, nematodes of both parasitic and saprogenous genera were much less numerous than in agricultural soils. The results suggest that plant-parasitic nematodes are not a disturbance factor in the areas examined.—P. J. Salisbury, Victoria Forest Biology Laboratory, and J. E. Bosher, Saanichton Plant Pathology Laboratory.

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